

SPRING BARLEY AGRONOMY

SPRING BARLEY - PLANTING:

Spring barley plantings for 2016 across England have shown an increase of 6% since 2015, taking the total area to 682,000ha. This is the highest area since 2013, which was due to a rise in spring planting as a result of the very wet 2012 autumn and winter. The introduction of the three crop rule may have also contributed to the increase in spring plantings, as well as growers recognising the need to adopt different cultural control methods in a bid to tackle the ever increasing threat of blackgrass.

Interestingly, many thought this was a peak for spring barley production and that the plantings would fall back to an average level similar to 2013. However, many growers have recognised that spring barley in the rotation is both beneficial and indeed profitable with good economic returns to be made. Spring barley plantings in 2017 are expected to rise significantly again - mainly due to the crop's benefits and partly because of the dramatic loss of

many winter oilseed rape crops this autumn, due to poor establishment in dry conditions and Cabbage Stem Flea Beetle attacks in specific regions.

Scotland differs from England and saw a fall of 5% in 2016 plantings, to a total area of 243,000ha, similar to 2010 levels. This was mainly due to a decrease in malting barley demand because of over production in 2013/14, leading to fewer malting barley contracts being available. Thankfully demand has now caught up with supply, and spring barley plantings across Scotland are set to rise again over the coming years.



SPRING BARLEY - INTRODUCTION:



Spring barley yield potential has increased significantly in the last ten years, with breeders pushing for higher yields, combined with good agronomic characteristics and end-use attributes. New varieties added to the AHDB Recommended List are 10%+ higher yielding than Concerto, which was

introduced in 2009. New malting varieties now have equal or better yield potential than standard feed varieties, thanks to breeders influence on germplasm.

Limagrain UK have a very successful breeding programme and are interested in driving the additional yield benefits of new varieties and the improved agronomic attributes, which may influence variety performance both on farm and with the end-user. It is important growers' recognise that additional yield improvements may have implications on how we grow spring barley, to achieve high yields and meet contractual specifications of the chosen end market.

Limagrain continue to invest in trials, both internally and externally, to evaluate the agronomic requirements of the spring barley crop and the subtle differences between varieties, ensuring both high yield and end-use specifications are met. Areas of interest include sowing date, seed rate, tillering ability and additional nitrogen strategies. These are all key attributes necessary for ensuring good crop performance, which we will now look at in more detail.

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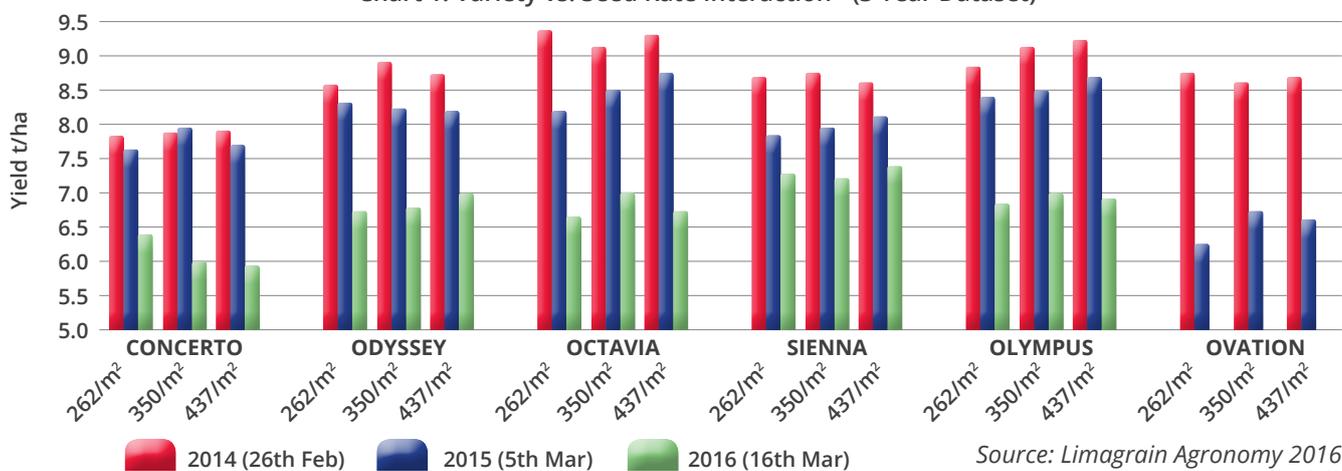
SPRING BARLEY - SEED RATE:

Limagrains do not advise definitive seed rates for spring barley and can only suggest suitable seeding rates, based on a breeder's knowledge of the variety gained through both plot and field trials. Grower's knowledge from previous experience of drilling date, soil conditions and yield performance on the farm, are even more important for determining an appropriate sowing rate.

Limagrains have carried out trials for three consecutive years, looking at both drilling date and sowing rates across Scotland and England to determine optimum seed rate figures.

Chart 1 shows a three year data set for a trial site in Norfolk for a range of Limagrains varieties, looking at three seed rates with a standard 350 seeds/m² against +/- 25% for comparison. Please note the three differing drilling dates for each year.

Chart 1: Variety vs. Seed Rate Interaction - (3 Year Dataset)



Source: Limagrains Agronomy 2016
Site: Docking, Norfolk

The newer varieties certainly show a significant yield increase over standard control Concerto. Although the yields at differing seed rates would appear similar, the general trend would suggest that the 350 seeds/m² had a slight advantage for most varieties over the three years (in the full dataset).

Drilling date would certainly appear to have an influence on final potential yield, but we think it's important to stress that very early drilling should only be pursued if weather and soil conditions, including temperature, allow for good germination and plant establishment. Patience is a virtue especially regarding the sowing of any spring crop. Waiting until conditions

are favourable is essential.

The conclusion of three year's work would suggest that a starting point of 350 seeds/m² appears to be the optimum for most varieties in ideal growing conditions. This figure can then be either increased or decreased depending on the situation, as outlined previously, this would concur with standard seed rates of around 325 - 375 being used by growers on farm today.

Seed rates should only be increased significantly if drilling conditions are not favourable, such as in wet springs or blackgrass control situations which may lead to a delayed drilling date (mid-April onwards).

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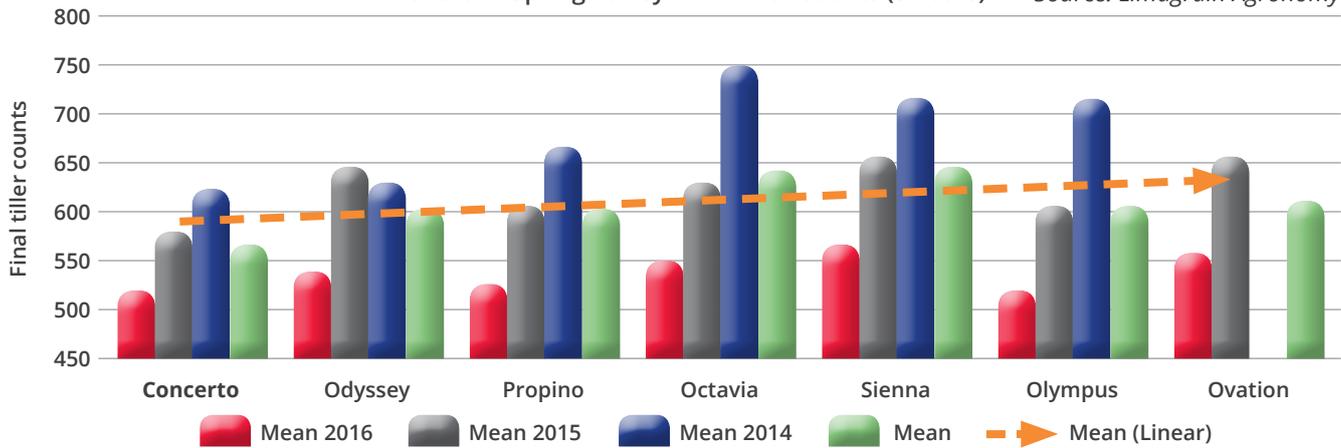
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SPRING BARLEY - TILLER COUNTS:

Limagrains have been recording tiller counts for several years in Scotland and data very strongly suggests that newer varieties are producing higher tiller counts, with the benefit of increased yields. Varieties with higher tiller counts have an advantage in situations of stress, i.e. drought, showing that they will compensate

where plant numbers are low. Whereas low tillering varieties are limited in their capacity to compensate. Interestingly, the target final tiller number in the AHDB Barley Growth Guide is 775/m² (3 shoots/plant). Looking at both trials and farm plant populations this appears to be underachieved in many situations, suggesting that full yield potential is not being reached.

Chart 2 - Spring Barley Final Tiller Counts (3 Years) Source: Limagrains Agronomy



Limagrains has a comprehensive data set for variety tiller counts and Chart 2 shows that over three years, the newer varieties do have higher tiller counts than the older control varieties; Concerto and Propino. Exploring data from trials in 2015 and 2016 of tiller counts vs. yield performance, it is very evident that establishing and more importantly maintaining a final tiller count of around 775/m² will ensure full yield potential. A lower tillering variety such as Concerto will achieve very high yields if the target figure is met. Consideration should be given to either a higher seed rate or additional nitrogen inputs if plant counts are low. Concerto suffers severely if tiller counts are low, whereas newer lines would appear to compensate better due to their ability to produce higher tiller counts from lower plant counts if the season dictates.

Interestingly, trials would suggest that final tiller counts can be pushed over 1000/m² in very fertile soil conditions, but results would suggest no additional yield performance over the 750/m² final tiller target. Additionally, it can lead to negative agronomic traits being induced, such as lower specific weights, higher screenings, additional lodging pressure and increased disease pressure.



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SPRING BARLEY - BLACKGRASS SITUATION:

Spring barley used as a strategic crop for the cultural control of blackgrass has shown itself to be very competitive, with very good results having been shown from three years in external trials, and more importantly on farm. Seed rates of 400 to 500/m² have been promoted for this situation, but our view is that if

growers use higher tillering varieties, seed rates of 400/m² should be appropriate if conditions are favourable. Many growers in a blackgrass situation are growing spring barley for the feed market and not targeting specific market outlets such as malting and distilling. In this situation, varieties such as; Sienna, Olympus and Ovation should be considered.

SPRING BARLEY - NITROGEN INTERACTION:

Limagrains have a theory that if spring barley yields have increased by more than 10%, perhaps the conventional approach to the crops fertiliser regime should be investigated, to see if additional yield performance can be obtained with higher rates of Nitrogen. Of course, this is not straight forward as the final grain Nitrogen % cannot be compromised, especially if growing for the malt distilling market which requires a low grain Nitrogen content. Higher grain Nitrogen levels required by brewing and grain Nitrogen contracts should offer opportunities for driving additional yield potential with higher rates of Nitrogen, while still achieving the specific grain Nitrogen %. The importance of each

market you are growing for and the grain Nitrogen content required cannot be underestimated, as this will dictate both variety choice and agronomic practice.

Limagrains have been conducting trials work looking at variety interaction with differing Nitrogen rates in some detail over the last couple of seasons. The following data is from a trial carried out in conjunction with Scottish Agronomy, looking at two Nitrogen inputs over a range of Limagrains varieties. Two Nitrogen inputs were tested, 120kg/ha in total applied to the seed bed, supported by an additional 30kg applied at tillering, making a total input of 150kg/ha.

Chart 3: Variety vs. Nitrogen Interaction - Yield

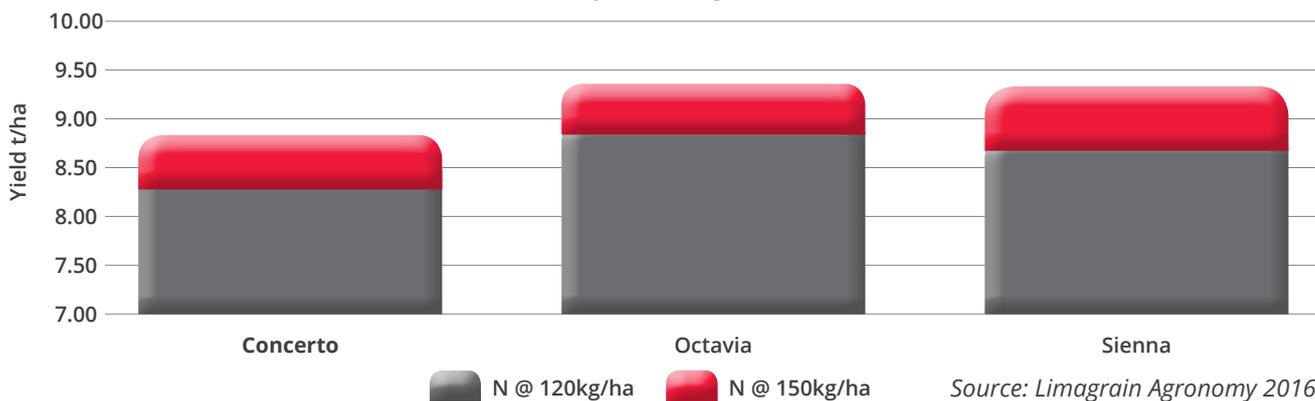


Chart 3 shows the additional yield performance associated with the extra 30kg/ha applied over the

standard seed bed application of 120kg/ha. The result was an additional 0.4 - 0.5t/ha yield across the varieties. This is significant certainly in a commercial situation, but has to be judged along with the actual grain Nitrogen % figures which can be seen in Chart 4.

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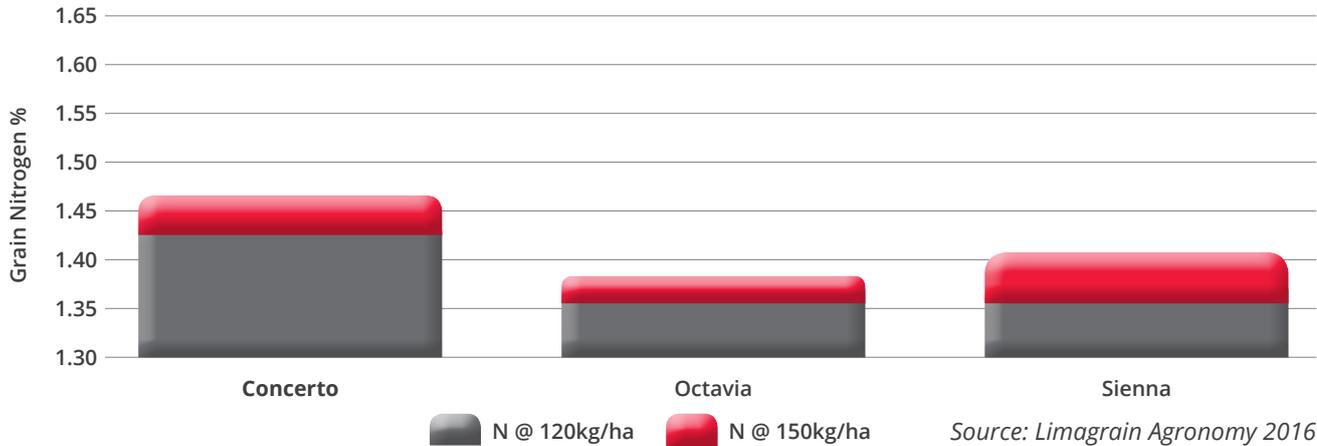
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SPRING BARLEY - NITROGEN INTERACTION continued:

Chart 4: Variety vs. Nitrogen Interaction - Grain N %



Interestingly, the grain Nitrogen % did not increase significantly, remaining below the contract specification of below 1.65% grain Nitrogen for Malt Distilling contracts. One could argue that the additional yield had a dilution effect on the final grain Nitrogen %, as anticipated. It

should also be taken into account that grain data from both internal and external trials during 2016 would appear to confirm that it was a season of lower grain Nitrogen accumulation, highlighting the importance of continuing trials over several seasons.

ADDITIONAL POINTS OF INTEREST FROM LIMAGRAIN TRIALS CARRIED OUT IN 2016 :

-  A higher Nitrogen rate with an additional 30kg/ha at growth stage 12-20 gave a yield increase across all seed rates. Grain Nitrogen % was not compromised in this specific trial - ongoing trials evaluation to be continued.
-  Concerto is a lower tillering variety compared with the newer high yielding varieties. Seed rates may need to be increased to compensate for this factor.
-  Additional Nitrogen to the lower tillering varieties i.e. Concerto at the lower seed rate (250 seeds/m²) increased both tiller numbers and final yield significantly.
-  Higher tillering varieties; Octavia and Sienna, were able to compensate for low seed rates because of increased tillering capabilities.
-  Nitrogen increased yield potential due to enhanced associated traits such as plant health, ear fertility, grain size and extended grain fill period.
-  Seed and Nitrogen rate would appear to have no influence on final specific weight, although differences were noted in Olympus.
-  Sienna has excellent specific weight credentials.
-  Taller, high tillering varieties should be considered in a blackgrass situation, instead of significant seed rate increases.

“Limagrain will continue to assess varieties for agronomic performance, to ensure that both growers and maltsters receive detailed guidance, in order to achieve the full yield potential and desired end-use attributes, making sure that the true potential of the variety is recognised”.



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